

Message

**From:** Davis, Eva [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D2BB073C80BE4F5482E94FFE2031042B-DAVIS, EVA]  
**Sent:** 10/4/2016 2:55:40 PM  
**To:** Steffen Griepke [sgriepke@terratherm.com]; Gorm Heron [gheron@terratherm.com]  
**Subject:** RE: TCH under a building

Thanks Steffen and Gorm for the responses. Is it a problem for TerraTherm that some of your equipment is being held hostage at Williams? I thought mostly what was left there of your equipment was eductors, which I didn't figure you needed for another site right away. EPA's stop work order was not meant to inconvenience TerraTherm, we may be able to allow you to retrieve your equipment if this is a problem for you.

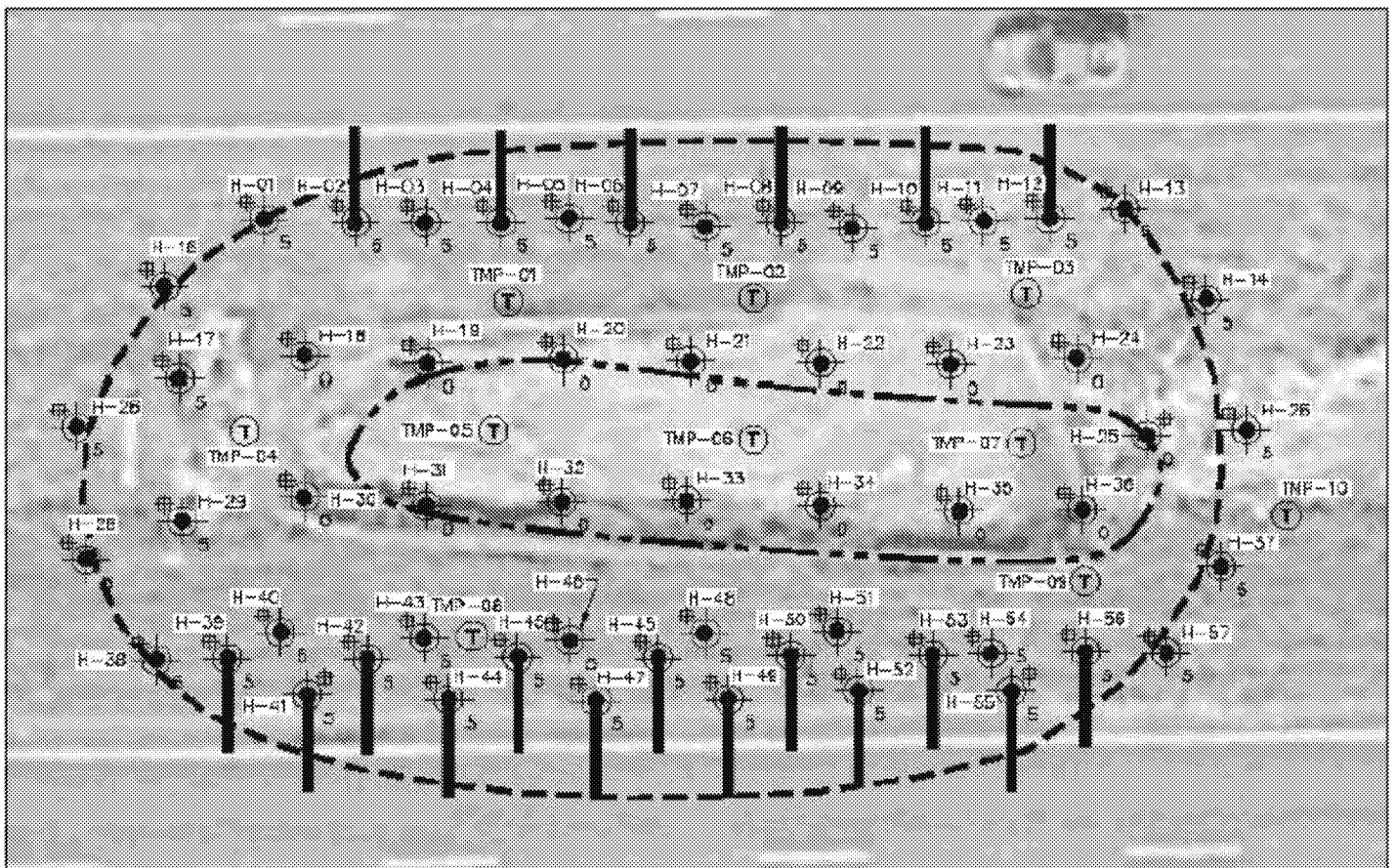
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**From:** Steffen Griepke [mailto:sgriepke@terratherm.com]  
**Sent:** Monday, October 03, 2016 11:10 AM  
**To:** Davis, Eva <Davis.Eva@epa.gov>; Gorm Heron <gheron@terratherm.com>  
**Subject:** RE: TCH under a building

Hi Eva,

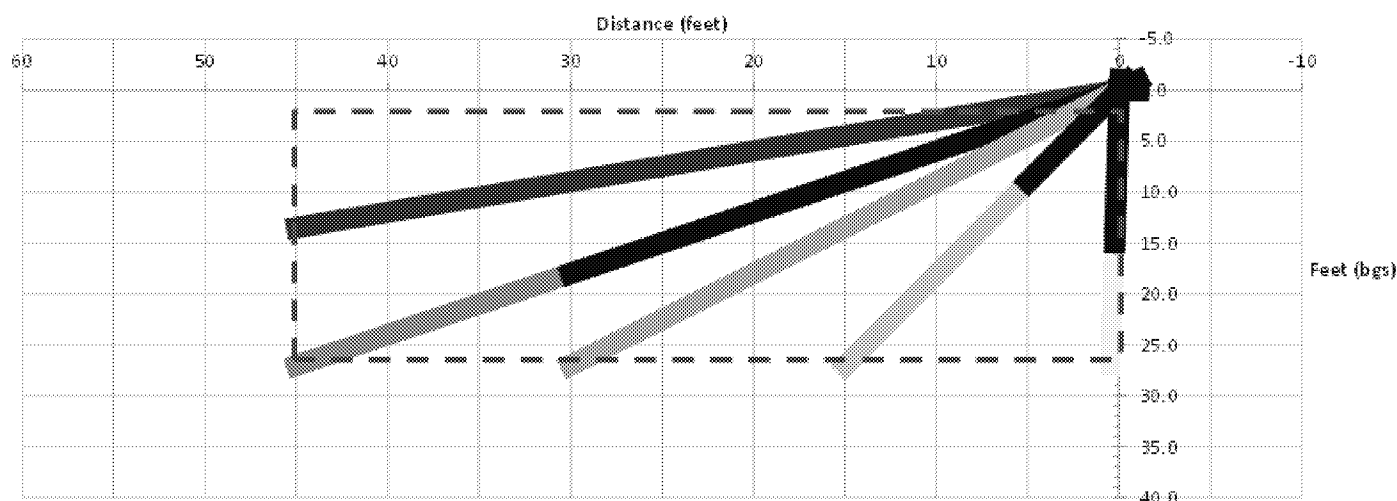
Please see the picture attached – we installed this well last Friday at our site in Grafton, WI. So, yes, we can easily do slanted heater borings. This one was installed in a roughly 35 degrees angle.

The wellfield layout below shows another example, where we planned on reaching in below a highway, without getting too close to the roadway.



The issue is that the angled wells results in the heaters being very close at the drilling location, and as deeper we go, the further apart the heater tips gets. Therefore we would equip some of the heaters with a "cold pin" (such that they don't

put out any energy) at the top and only have the heated section on some of the heaters be deep. See concept below. If we didn't do that, the top part (where heaters are close) would get much more energy input, than the bottom part.



We have never done horizontal wells installed by horizontal drilling as far as I remember, but I don't think it would be a big deal. The heaters are of course extremely flexible, but the heater cans and liners have some kind of bending radius, that we would have to keep in mind. Gorm, any input?

Yes, we are not at all in the loop on Williams anymore – some of our equipment are still held “hostage” at the site. But we are officially still “locked down”. What you are mentioning don't surprise us though!

On a happier note, seems like Beede Phase 2 is moving – we are meeting with W&C and Skinner next week at the site to look and discuss options for the Phase 2 area.

Steffen

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**From:** Davis, Eva [<mailto:Davis.Eva@epa.gov>]  
**Sent:** Monday, October 03, 2016 11:42 AM  
**To:** Gorm Heron; Steffen Griepke  
**Subject:** TCH under a building

Hey Gorm and Steffen –

Hope all is well with you guys and TerraTherm –

I'm looking at a feasibility study for a site where there is contamination under an active manufacturing building. Supposedly the manufacturing equipment within the building is large, and there is no way wells could be installed at the spacing that would be needed for TCH. Have you ever used angled heater wells under a building? Could it be done? I know TRS has used horizontal wells under buildings on one or two occasions – could TCH be deployed via horizontal wells?

Don't know if you guys are still under orders not to discuss Williams, so we won't discuss it, but now AMEC wants to evaluate all the remedial alternatives for the additional LNAPL – how many times do we have to go through this search-for-a-magic-bullet-that-is-not-steam exercise for this site?

Thanks Eva